Siberia experiences extreme cold in winter, humidity is surprisingly high, usually 80%. But vapor pressure is very low, about 1 mm, owing to the low temperatures. In this sense Siberia can be said to have a dry atmosphere. In the spring the rapid rise in temperature is not accompanied by an increase in moisture, so that humidity decreases everywhere, and reaches its minimum in May or June, with a reading of 60% or 65%, slowly increasing after this date. Vapor pressure increases with the rise in temperature, and reaches its maximum at the same time as temperature, i.e., in July, with a reading of 10 mm or over. In summer, a rise in atmospheric temperature is caused by the heat of the earth's surface; and in summer precipitation takes the form of showers, which are frequent, especially in the mornings. These places have a tropical type of rainfall, and contrary to expectation there are many thunderstorms. These are particularly frequent in the zone between 50° and 60° N, the average yearly number of days of thunder being 15, mostly in the summer. These storms are less and less frequent as one proceeds north and south of this zone. Thus, the deserts of Mongolia and Central Asia, where the temperature in the summer is very high during the day and the atmosphere contains little moisture are less subject to thunderstorms.

Siberia has a high proportion of clear days in the winter due to the high pressure area gathering over it. The average sky cover in the western Siberian plains is 6 - 7; in Mongolia, Manchuria, the Transbaikal region, the Amur region, Yakutsk Province, and in the Maritime province sky cover is exceptionally small, generally about 3. The Turkestan area of Central Asia, however, has a comparatively large cover of 5 or 6. The winter in these areas is inclined to be damp and to have more rainfall, humidity, and sky cover than in the summer. The readings for Tashkent for January, for precipitation, humidity, and sky cover respectively are 44 mm, 74%, 6.4; and for July, 3 mm, 46%, 1.7, the summer being very dry. In the Turan plain east of the Black Sea

the monthly precipitation in winter is extremely slight, about 10 mm. In summer it is also very dry, with a precipitation of 1 - 4 mm, so that it is to all intents and purposes a desert. When the summer prevailing wind sets in, sky cover over Manchuria, Mongolia, and the Maritime province increases to 5 or 6, and rainfall moves from Manchuria and the Maritime province into the interior of Siberia. The rainfall in Mongolia is somewhat heavier, but is still insufficient to moisten the earth. In western Siberia, the sky cover decreases from winter onwards to 5 - 6, but rainfall increases and in July there is a fall of 60 - 70 mm. The reason for this is the proximity of the low-pressure area of Europe. On the coasts of the Arctic Ocean, sky cover rises to 7, and rainfall increases slightly, and rises to 30 mm in July, but never goes beyond this figure.

When the summer prevailing wind sets in from about May onwards, it is frequently foggy in the Bering Sea, and Sea of Okhotsk and on the shores of the Sea of Japan. Fog increases in July and August, when half the total number of days of the month may be foggy. This decreases rapidly as one proceeds inland, but there are several days of fog per month in Irkutsk Oblast, the Transbaikal Krai and the Amur Krai, especially in July and August. There is, on the other hand, a great deal of fog in the winter and in the Lena and Yana River basins a large number of days per month are foggy. In winter there are a large number of sunny days, but the climate is extremely cold; it is thought that this cold, in conjunction with radiation, causes the fog. The vicinity of the Yamal Peninsula and the Taimyr Peninsula on the coast of the Arctic Ocean is extremely foggy, having about 100 days of fog in a year.

As regards evaporation, in winter the climate is extremely cold, and humidity is proportionately high; but all moisture takes the form of ice,

and the amount of evaporation from the surface of the ice is very small. At Tomsk in western Siberia the total monthly evaporation for January (measured in the shade) is barely 1.2 mm; at Barnaul it is 3.4 mm; at Borovia Ozera 5.0 mm; and at Nerchinski - Zavod in the Transbaikal region less than 1 mm. No data is available on evaporation at other places, but it is thought to be approximately the same. In summer, when the temperature is high, humidity is somewhat less and evaporation proportionately higher. The monthly evaporation for Tomsk in July is 53 mm; at Barnaul 110 mm; at Borovia Ozera 191 mm; at Omsk 100 mm; and at Nerchinski-Zavod, 57 mm. With the exception of Tomsk, evaporation exceeds the volume of rainfall.

During the winter, places at high latitudes have extremely short days and long nights. In the summer the reverse is true. As already described, during the summer the dusk merges with the dawn, giving rise to the phenomenon known as the "white night". At the period of the winter solstice, the sun does not rise at all on the Arctic Ocean coastal regions, and all ~~the~~ summer solstice it does not sink below the horizon, but continues to circle around the sky. The following tables gives several examples of the hours of sunshine and sunshine ratio during January and July.

~~(Chart on page 5 of Annex)~~

Place Name	January		July	
	Hours of Sunshine	~~Rate of Sunshine~~ (%) Insolation	Hours of Sunshine	~~Rate of Sunshine~~ (%) Insolation
Staro-Sidorovo	62	33	276	63
Zyryanovski Rudnik	72	38	248	61
Golous Knoye	110	56	254	58
Chita	149	67	259	56
Krasnoyarsk	19	13	326	72

Thus it follows from the above that there is a great deal more sunshine in summer than in winter. In western Siberia there is more sky cover and a greater number of days with ~~rate of~~ insolation

~~sunshine~~ in winter is much less than ~~that~~ in summer. Chita, in the Transbaikal region, however, has an extremely dry climate in winter and a succession of fine days, so that ~~the rate of sunshine~~ insolation in this region is ~~higher~~ greater in winter than summer.

Although Siberia has an extremely cold climate in winter and the temperature rises considerably in summer, the climate of the area round Lake Baikal and of the far eastern coastal region is affected by the lake water and ocean respectively, which temper the heat and the cold. The rise and fall of temperature in spring and autumn are much less abrupt there and the ~~yearly~~ annual difference in temperature less pronounced. The climatic conditions of these particular areas can be more clearly understood if one compares the temperature of Mysovaya on the edge of Lake Baikal with that of Chita in the Outer Baikal region, or that of Nikolayevsk or Okhotsk on the Pacific Ocean with that of Kerbino or Yakutsk within the continent. Below is a comparative table of the temperatures for these places.

NOTE!

(Chart on page 6 of Annex)

	Place Name	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Year	Difference
a	Mysovaya														
b	Chita														
c	Nikolayevsk														
d	Kerbino														
e	Okhotsk														
f	Yakutsk														

2. Distribution of Atmospheric Pressure and Prevailing Winds

Siberia has a continental climate and in winter is extremely cold, but the huge thermal capacity of the surrounding oceans prevents the temperature from falling as low as it otherwise would. The result is a high pressure area stretching from the Aleutian Islands to Kamchatka. Cold, warm winds blow clockwise from this high pressure area to the low pressure areas of the

the winter climate of Far Eastern Asia. In summer the continent is flooded with strong sunshine and becomes extremely hot, but the temperature of the surface of the sea does not rise any great extent, with the continent becoming a vast low pressure area and the North Pacific a large high pressure area. Thus in the summer a warm moist wind blows off the the sea over the continent. This is the wind that determines the summer climate of Far Eastern Asia. Thus, as explained above, the atmospheric pressure in Siberia is highest in winter (January and February) and lowest in summer (July). In winter, however, Kamchatka is adjacent to the low pressure area of the Aleutians and has its lowest atmospheric pressure in December and highest in June. This is because at this time the Sea of Okhotsk high pressure area extends over both the Sea of Okhotsk and Kamchatka, and as July approaches, the Okhotsk Sea high pressure area disappears, and the Kamchatka area becomes the route for the continental low pressure area. The atmospheric pressure then decreases slightly, but rises again in August. The shores of the Okhotsk Sea and the Karafuto [Sakhalin] area lie on the dividing line between the two atmospheric pressure systems. They do not experience a marked change of climate during the year, and the nature of their climate is somewhat complicated, as these areas have two high pressure peaks in spring and autumn, and two low pressure peaks in summer and winter.

In winter the wind velocity is generally low, from 2 to 4 meters per second. It is particularly light, from 1 to 2 meters per second, in the mountainous regions to the south, in Irkutsk province, in the Transbaikal area, and in the Amur and Yakutsk areas, where there is a large proportion of days of calm weather. These areas have an extremely cold temperature of between -20° and -30°, but it is a comparatively bearable cold, owing to the stillness of the air. The coldest nights are usually for

(Continued)

(mask p 7)

Wind Velocity (M/sec)

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Entire Year	Period Covered By Statistics

(Place Names as follows:)

Obdorsk a
Surgut b
Tobolsk c
Omsk d
Akmolinsk e
Gizhiga f
Turkhansk g
Yeniseisk h
Tomsk i
Barnaul j
Semipalatinsk k
Minusinsk l
Kirensk m
Irkutsk n
Chita o
Kazachije p
Russkoye Ustye q
Nizhne Korimsk r
Verkhoyansk s
Vilyuysk t
Yakutsk u
Olekminsk v

Blagoveshchensk w
Khabarovsk x
Vladivostok y
Mikolaevsk z
Okhotsk aa
Novo-Marinskiy Post bb
Petropavlosk cc
Alexandrovsk dd
Nikolsk (Bering Island) ee

calm weather in January: Irkutsk 50%; Chita 58%; Nerchinsk 88%; Blagoveshchensk Priisk 76%; Olekminsk 68%; Yakutsk 40%; Verkhoyansk 44%. It can be seen from these figures that over half of each month is windless. The coastal area of Far East Asia has a greater wind velocity, 5 to 8 meters per second, owing to the proximity of the high pressure area.

The conditions at the beginning of spring and autumn are different, with greater wind velocities. In the ~~Heilung~~ Amur river basin and the coastal area the wind reaches its highest velocity in April and May, during the transit of the continental low pressure area. In addition, the wind velocity reaches a second peak in October during the transition of the continental low pressure area. Insert Wind Velocity Table (P.7 Amur) here.

In Maps Nos 1 to 13, which show the distribution of atmospheric pressure and principal wind directions for each month, the arrows indicate the frequency of wind direction according to the following system:

< 35%	51% - 55%	71% - 75%
36% - 40%	56% - 60%	76% - 80%
41% - 45%	61% - 65%	81% - 85%
46% - 50%	66% - 70%	86% - 90%

The maps give the atmospheric pressure figures and the distribution of the ~~main~~ prevailing winds and show their seasonal changes.

The continental high pressure reaches its peak in January and February and shows a reading of 775 mm or over at its center in Mongolia. The whole of the continent of Asia is covered by this high pressure area. The winds blow out to sea in a clockwise direction. In the regions surrounding Lake Baikal the southwestern wind of the Western Siberian Plains is modified by blowing over the lake water which is ~~a great deal~~ much warmer than the surrounding country and has a tendency to blow towards the middle of the lake. The prevailing wind of the Transbaikal and Amur Regions is northwest; that of the

the Bering Sea in northwest or north; and that of the coasts of the Arctic Ocean in southwest or south.

In March the area of high atmospheric pressure is in the same position as in the previous month. It shows a diminished reading of 771 mm at its center, and part of it shifts towards the southwest. The prevailing wind directions remain much the same.

In April, the center of the high pressure area has a further diminished reading of 766 mm. It moves towards the northwest, and at this date is located in the northern part of Central Asia. The Aleutians' low pressure area begins to move towards the Maritime Province and Manchuria, and although there is no great change in the direction of the prevailing winds, they are somewhat less frequent. On the shores of the Sea of Japan, however, the wind shifts west to south, and the prevailing summer wind begins to set in.

In May, the high pressure decreases to 762, and until its dissolution remains over an area stretching from the northern part of Central Asia to the southern part of European Russia, and the area of low pressure begins to move in from Mongolia towards Manchuria and the Lena river basin. In Western Siberia the prevailing wind is for the most part westerly. In the Transbaikal area it blows northwest towards the low pressure area of Manchuria. In the coastal area of the Maritime Province, the summer prevailing winds begin to blow south or southeast in contrast to Japan and South Central China where winter conditions still continue.

In June the high pressure area that continued during May over the northern part of Central Asia loses its form and all high pressure over the continent disappears. The low pressure area spreads out over Mongolia and Manchuria, and over the Lena and Yenisei river basins and the pressure gradually drops to 754 mm in Mongolia, Manchuria and the Transbaikal area. In Western and Central Si-

the northwest; in the Amur Region, from the north or northeast; in the coastal area of the Maritime Province, from the south to southeast; and in the coastal area of the Arctic Ocean, from the northeast. All these winds blow toward the interior of the continent.

In July the pressure reading is 753 mm or lower over the larger part of Siberia. The summer prevailing wind reaches its maximum velocity, blowing from the sea towards the interior of the continent and the low pressure area of Mongolia. It blows south or southeast in the coastal areas of the Maritime Province; east or northeast in the Arctic Ocean coastal areas; due west in western Siberia; and north or northeast in the Transbaikal region.

In August the location of low pressure areas and prevailing winds are much the same as in July, and atmospheric pressure is everywhere low.

In September, when winter begins, the low pressure area begins to break up. The high atmospheric pressure of the European area moves in towards Mongolia; soon a high pressure area is formed over the continent, and a low pressure area is formed from Manchuria over the Sea of Okhotsk and the Kamchatka area. In a short while the winter prevailing wind sets in over China, but in the interior of Siberia and in the coastal areas of the Maritime Province the prevailing wind direction does not change yet, as would be expected from the position of the atmospheric pressure at this time. For the rest of the year the wind direction does not change greatly over most of Western Siberia and the southern part of the mountainous regions. It blows from the land towards the sea; that is, south or southwest over the Yamal and Taimyr Peninsulas on the arctic coast, west in the vicinity of the Lena river mouth which lies east of the above peninsulas, and north over the coasts of the Sea of Okhotsk.

In October the high pressure area of the winter is fully formed and has a reading of 768 mm at its center, which is at a position near the borders of

Siberia and Northern Mongolia. The prevailing winds are those of winter; ~~and~~ the southwesterly summer wind which had continued to blow over the coasts of the Sea of Japan until September has shifted to the northwest and the prevailing wind over the coastal areas of the Arctic Ocian is now southwest.

In November and December the location of atmospheric pressure is much the same as in January, the centers of high pressure being 773 mm and 774 mm respectively at a position over Mongolia. The prevailing winds are the same as in January and February.

3. Temperature

With the exception of the coastal area of the Maritime provinces and the Lake Baikal area, Siberia has a ~~surprisingly~~ remarkably continental climate. It has ~~a yearly~~ an annual variation in temperature of 40° C to 60° C, which compared to the 22.6°C variation experienced at Tokyo is remarkably ~~great~~ large. The solar radiation ~~that reaches places~~ at high latitudes in winter is extremely weak. The nights are long, evaporation is very slight, and the solar radiation provides little warmth. Verkhoyansk is believed to be the coldest place in the world with ~~the~~ an average temperature in January of -50.1°C and a minimum recorded temperature of -67.8°C. We will give here several possible reasons for the exceptionally low winter temperatures of the Lena River, the Yana River, and the Indigirka basin, which are near Verkhoyansk:

1. Location at a high latitude and the fact that the ground freezes rapidly.

2. In winter there is little snow or humidity or evaporation in this area. There are continuous periods of fine weather which causes a large loss of heat by radial cooling and consequent extremely low temperatures.

3. The snow cover over this whole area is very slight, about 20 to 30 cm. The snow cover does not build up because of the cold temperatures, which fact

contributes to the extremely low temperatures.

4. The moist air from the sea does not reach these areas, as in Europe or Western Siberia.

5. The atmosphere is for the most part still and windless and the cold air of the earth's surface does not mix with the warmer air currents of the upper strata.

These are the main reasons for the low temperatures in the regions around Verkhoyansk.

The ~~average~~ mean January temperatures for all parts of Siberia are between -25°C and -40°C and the ~~average~~ mean temperatures in July are 10°C to 20°C. In the coldest place, Verkhoyansk, the average July temperature is 15°C and compares with the same temperature of Shikuka in Karafuto [SAKHALIN] ~~is the same~~ in August. The most characteristic feature of this climate, apart from the fact that it is a most perfect example of a continental climate, is the great variation in winter temperatures from year to year. It will be seen from the examples given below of mean January temperatures between 1895 and 1905 that the difference ~~margin~~ between the highest and lowest average January temperatures is as much as 10°C to 15°C within a short period, which is an extremely ~~wide~~ great variation ~~difference~~, considering that the margin in Tokyo is from 3°C to 5°C. If this variation took place in Japan it would have an ~~extremely~~ drastic effect, but in Siberia everything is frozen and all living creatures go into hibernation so the effect of the variation is not felt. In the Maritime regions of the Far East the heat and cold is greatly mitigated by the proximity of the sea and Lake Baikal has a similar effect on its surroundings. As already described the temperature undergoes swift changes in spring and autumn, winter making an abrupt transition ~~with~~ into summer and summer into winter.

Mean January Temperatures

	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904	1905
a Tomsk	-22.6	-19.1	-23.8	-13.5	-14.6	-28.6	-20.0	-13.8	-17.5	-17.4	-16.1
b Yeniseisk	-30.8	-20.2	-25.3	-14.3	-15.7	-28.9	-20.9	-18.2	-21.7	-24.1	-16.6
c Yakutsk	-49.0	-40.1	-49.2	-42.7	-42.4	-51.2	-44.4	-48.4	-37.2	-38.5	-35.4
d Verkhoyansk	-49.3	-47.6	-51.4	---	-50.8	-53.9	-51.3	-50.3	-44.2	-47.2	-49.9
e Surgut	-26.0	-23.9	-29.9	-17.0	-18.3	-28.4	-26.8	-22.5	-24.7	-17.7	-22.8

Maps 14 to 27 give the monthly distribution of temperature reckoned at sea level.

January is the coldest month of the year. The temperature falls to -50°C in the Verkhoyansk area, which is enclosed by the innermost isotherm. As one proceeds outwards from this area the temperature rises. The Siberian continent east of the Urals is within the -20° C or below range; the Lake Baikal region and the Maritime province, where the climate is tempered by the proximity of the lake water and ocean respectively are mild compared with the interior of the continent.

In February the isotherms remain much the same as in January, but the temperature is slightly higher.

In March the wintry conditions begin to disappear to a very small extent in the Verkhoyansk area and the isotherms are almost parallel to the lines of latitudes. The whole of Siberia still has temperatures of under -10°C.

In April the isotherms are almost parallel to the lines of latitude, and the isotherm 0°C stretches from east to west along the latitude 52° north. The temperatures on the Arctic coast are below -20°C.

In May the temperature is steadily rising in all places, and the isotherm 0°C now lies along the latitude 67° north. About this time the influence of

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straight from east to west, but near the seacoasts they make a sudden curve southwards, and in the Far Eastern coastal areas they follow the line of the sea coasts. The temperature of Lake Baikal is lower than that of the surrounding country.

In June the temperature of the continent rises continually, but there is no increase in the temperature of the seas or of Lake Baikal, so that the effect they have on the climate in these areas is now very marked, and in the far eastern coastal regions the isotherms now run absolutely parallel to the seacoasts. The seacoasts and Lake Baikal are several degrees cooler than the interior of the continent and the surrounding land respectively. The isotherm 0°C has shifted to the far north and now runs from the shores of the Bering Sea along the Arctic coastline. This is the Siberian summer season, and gradually all its rivers thaw and become ice-free.

July is the hottest month of the year and the isotherms run for the most part east and west. The temperature is 20°C in Southern Siberia and 5°C on the Arctic coast. As in July, the isotherms run parallel to the coastline in the Far Eastern coastal districts, and the temperature of Lake Baikal is extremely low.

In August the temperature of the interior of the continent is 2°C to 4°C lower than in July, but it rises on the coasts of the Sea of Japan, and in the southern part of Kamchatka where the temperature now reaches its maximum for the year. The influence of the sea and lake water is still evident and the coastal areas are considerably cooler than the interior of the continent.

September is the month of transition into winter. The temperatures of land and sea are about equal; the isotherms no longer follow the curves of the coastline, but run east and west parallel to the lines of latitude, and register 0°C on the Arctic coast and 12°C along latitude 50°north.

By October the temperature falls considerably and is zero north of latitude [illegible]. The influence of the sea and lake water is still apparent, and the isotherms curve from south to north and run parallel to the

coastline. The coastal area is warmer than the interior of the continent and the Lake Baikal area is warmer than the surrounding country.

In November the temperature drops still lower, reaching -35°C at its lowest point in the Verkhoyansk area, and all of Siberia east of the Urals is in the -10°C temperature range. The effect of the sea and lake water is increasingly marked. The isotherms follow the line of the coast in the Far East and Lake Baikal is a great deal warmer than the surrounding territory.

The temperature distribution in December is much the same as the previous month, but individual temperatures are somewhat lower. It is -45°C at its lowest point round Verkhoyansk and the rest of Siberia is below -20°C.

The next set of maps, Nos 28 to 39, show the dates in spring and autumn when temperatures become -15°C, -10°C, -5°C, 0°C, 5°C, 10°C and 15°C. Owing to the effect of the ocean and lake water the isotherms are generally retarded on the Far Eastern coastline and in the Lake Baikal area. In the middle of April the 0°C isotherm is found to lie in the vicinity of 50° latitude north. It moves gradually northwards and by the middle of June it lies along the Arctic coast. In Autumn, in the middle of September, it is seen to be on the Arctic coast and subsequently moves southward at a rate of 70 km a day.

By the middle of October it has reached the 50° latitude north zone at the extreme south of Siberia. In Spring the thawing of the rivers of Siberia follows the course of these lines. They start to thaw in the south and are generally ice free about 10 days after the isogeotherm 0°C has moved on northwards. In autumn the rivers freeze about 20 to 30 days after it has moved sourthwards. (The term freezing indicates that the river is covered with ice from bank to bank.)

The next set of maps, Nos 40 - 43, shows the number of days per year when the temperatures are -15°C, -10°C, -5°C and 0°C or over respectively.

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As shown in the maps, there are less than 180 days in the year when the temperature on the Arctic coast is lower than -15°C and about 90 when it is above zero, so that for the greater part of the year this area is icebound and summer has only a short ice-free period. There is a larger proportion of mild days in the Far Eastern coastal area and the Lake Baikal area on account of the ameliorating influence of the ocean and lake water.

Maps No 46 and 47 show the number of days with maximum temperature below zero and the number of days with minimum temperature below zero respectively. The former is the number of days with no thaw and the latter the number of days when the temperature falls below zero. There are few such days near Lake Baikal, but there is a large number of such days in the mountainous regions of Transbaikal having a minimum temperature zero or below.

4. Humidity and Vapor Pressure

On account of the coldness of the Siberian winter humidity is generally about 80%, but vapor pressure is extremely low, about 1 mm, because of the low temperatures. In spring the temperature in the interior rises rapidly, but there is no corresponding increase of moisture, so that humidity diminishes and reaches its minimum in May or June. In autumn the temperature drops rapidly and humidity slowly increases and reaches its maximum in November or December. In the Far Eastern coastal area, however, where the climate is tempered by the prevailing winds and proximity of the sea, the winter is short and the summer long and vapor pressure increases and diminishes with the temperature, reaching its minimum in January and maximum in July. The following table gives humidity and vapor pressure figures for a number of different places:

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(Mask for Table, p 12 of app)

Humidity and Vapor Pressure

(The top figures give humidity in percentage; the lower figures give vapor pressure in millimeters.)

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
a	Obdursk	etc	etc	"										
b	Tobolsk	"	"	"										
c	Barnaul													
d	Tomsk													
e	Akmolinsk													
f	Yeniseisk													
g	Turkhansk													
h	Blagoveshchenskiy Priisk													
i	Yakutsk													
j	Russkoye Ustye													
k	Verkhoyansk													
l	Kirensk													
m	Irkutsk													
n	Chita													
o	Okhotsk													
p	Nikolaevsk													
q	Alexandrovskiy Post													

There is little humidity in the course of the year over the area between Mongolia, Sinkiang and Turkestan. These regions form vast tracts of arid land with a number of scattered deserts, principally the Gobi Desert. Humidity is much the same from November to March and is high in western and central Siberia.

It is slight over the area that includes Transbaikal, the Amur OBLAST, the west coast of the Sea of Okhotsk, the Kolyma River, the Indigirka River and the upper reaches of the Lena River, just as if this were an extension of the arid lands of Mongolia. The center of the low humidity area is Verkhoyansk and, it is thought, the fact that cold air of these regions (see maps on distribution of temperature and winds) flows into the comparatively mild areas of the shores of the Sea of Okhotsk, the Transbaikal and Amur areas is the reason for the lack of humidity. This can also be applied to the distribution of snowfall and rainfall and the effect can be seen clearly in the maps that deal with snowfall and rainfall. In western and central Siberia, humidity, snowfall, and rainfall are comparatively heavy, owing to the flow of the moist air from Europe into the cold Siberian plain.

The following gives a month-by-month survey of the distribution of humidity, as depicted in maps No 48 to 60:

In January, western and central Siberia have a high humidity rate of 80%; it is 70%-75% in the Outer Baikal region, the Amur region, the coasts of the Sea of Okhotsk, the Korima River, and the upper reaches of the Indigirka River; 80% on the coasts of the Arctic Ocean; and 81% at Ata Alma in the Kazakk region.

In February the distribution appears to be much the same, but somewhat lower at various places in the Transbaikal region and in the Amur region and the coasts of the Sea of Okhotsk.

As the temperature of the continent rises in March the humidity of western and central Siberia decreases to 75% and increases slightly in the Yakutsk area. It remains still low, between 65% and 70%, in the Transbaikal and Amur regions and in the Indigirka River and the upper reaches of the Yana River.

As the temperature rises in April there is a general decrease in humidity: 65% to 70% in western and central Siberia, 50% to 60% in the Transbaikal and Amur

regions, and 60% or less in the Verkhoyansk area. There is no great change of humidity on the coasts of the Arctic Ocean and the Far Eastern coastline, which register 75% and 80% respectively.

Humidity continues to drop in May, when it reaches its yearly minimum in central Siberia with a reading of 60% to 65%. It is 55% in the Verkhoyansk area and is even lower, less than 45%, in the dry zone stretching from Mongolia to Central Asia. It rises to 85% at some places on the Arctic coast and to 80% in the Far East Maritime area. Humidity tends to be low on the continent and high over the sea.

In June humidity is much the same as in the previous month, but the moist summer winds set in and blow from the sea over the Far Eastern coastal areas. Here humidity is generally higher, being over 80% on the coastline, in Kamchatka, and on the Arctic coast.

The temperature of the continent reaches its maximum in July and is also at its highest in the Arctic and Far Eastern coastal areas. At this time the summer prevailing wind is in full force and blows from the sea toward the land. As a result, humidity in the Arctic and Far Eastern coastal areas and Kamchatka is over 80%. Likewise the summer wind has the effect of producing approximately 80% humidity in the ~~Heilung~~ Amur River area. The cool moist sea wind blows over the continent, but as the temperature is high humidity is not particularly great. In central Yakutsk the temperature is fairly high, but the area is cut off from the moist summer wind by the intervening Stanovoi and Yablonovy Mountain ranges so that humidity is generally low. In Verkhoyansk it is 60%; in Mongolia and Turkestan it is extremely dry, about 40%, as in the previous month.

In August the temperature of the continent diminishes slightly and the humidity rises accordingly. It is 80% in the Far Eastern and Arctic Coastal areas, 75% to 80% in western and central Siberia, and 70% in the Verkhoyansk area. There is no change in Mongolia and Turkestan which remain as arid as before.

September is the season of transition to winter. The summer prevailing wind falls off and the winter prevailing wind sets in. The temperature of the continent drops rapidly, and humidity, on the contrary, increases. It becomes 85% on the Arctic coast, about 80% in Western and Central Siberia, and 75% near the Indigirka and upper reaches of the Yana river. On the Far Eastern coast it is somewhat less than in August.

In October the humidity is over 80% in western and central Siberia, and owing to the effect of the winter wind it is dryer (75%) in the Far East coastal area. It is particularly low, 70% or less, in the Okhotsk region.

In November the humidity rises to 80% or 85% in western and central Siberia, but decreases in the lower reaches of the Yenisei River. On the Far Eastern coast, the cold air from the interior blows over the mild coastal regions with a resulting decrease in humidity. From the east coast of Korea to Vladivostok it is 60%, and 61% at Okhotsk on the west coast of the Sea of Okhotsk. It is approximately 75% in the Outer Baikal and Amur regions, and 80% to 85% on the coasts of the Bering Sea and Arctic Ocean. As winter approaches there is a slight increase of humidity in Mongolia and Turkestan, but these regions do not lose their characteristic aridity. Mongolia has a humidity of 55% or less, and Turkestan had 65%, a remarkable increase compared with its summer rate.

Humidity is much the same in December as in November, but rises to 70% in Turkestan which is fairly moist in winter.

5.

Sky Cover

In winter, sky cover is extremely light over Northern China, Mongolia, Manchuria, Transbaikal, Amur, the western shores of the Sea of Okhotsk, the Yana River and the Indigirka river basin. These regions have a large proportion of fine days in winter, as precipitation is extremely slight owing to the dry climate. The distribution of humidity and rainfall can be clearly seen in the attached maps. Sky cover is heavy, however, in western and central Siberia and

Turkestan.

When the moist sea winds start to blow in summer, sky cover increases over the eastern coasts, the coast of Kamchatka and the Arctic coastal region; but though it increases somewhat over Mongolia, it is still light, having a ~~rate~~ value of 5 or under, as the summer winds are obstructed by the Tai-Ts'ing-an mountain range and do not reach the area. It is also slight over the upper reaches of the Indigirka and Konma rivers and the Aldan river basin, as these areas are cut off from the sea wind by the Stanovoi mountain range. The sky cover over Turkestan is 2 or less, and its dry summer is in strong contrast to its wet winter.

The following is a month-by-month survey of rainfall distribution, as shown in Maps No 61 to 73.

In January sky cover is slight over an area extending from Mongolia to Manchuria, Transbaikal, Amur, the west coast of the Sea of Okhotsk and Verkhoyansk, and has a ~~rating~~ value of 2 or 3. It is heavy, 6 to 7, in western and central Siberia, and 5 or 6 in Turkestan which is heavy compared with its summer cover of 1 or 2. It is light, 5 or below, in the interior of the Kamchatka Peninsula and 7 on its coastline. In the Arctic coast area it is 4 or 5.

There is practically no change in February, with the exception of a slight decrease in Turkestan.

There is no change in western and central Siberia in March. It increases to 3 or 4 in Transbaikal and Amur and on the west coast of the Sea of Okhotsk, and decreases to 4 or 5 in Turkestan.

In western and central Siberia it is still between 5 and 6 in April, but it decreases as one proceeds north, and is 4 or below on the Arctic coast. On the Far Eastern coastline it increases to 5 or 6. In the Kamchatka peninsula it is slight in the interior, but 7 or 8 on the coast. Transbaikal and Amur have a value ~~rating~~ of 4 or 5, and Mongolia and Turkestan of 4 or less.

In May sky cover is generally increasing all over Siberia. It is 6 or 7 in Western and Central Siberia; 5 or 6 in the south of Tobolsk Oblast and in Tomsk Oblast, Transbaikal and Amur; and it decreases as one proceeds south, being 5 or below in Mongolia and 4 or below in Turkestan. When the summer wind sets in it increases to 7 or over in the coastal areas of the Far East. However, it is only 4.4 in the Aldan river basin and Ust-Maya.

June is much the same as May, with the exception that sky cover further decreases in Turkestan to 1 or 2. It also decreases in the Aldan river basin and Ust-Maya is ~~about~~ 3.4 ~~roughly~~.

In July there is little change in Western and Central Siberia. Turkestan registers 2 or below and the Aldan river basin is 5 or less. This is because the summer wind loses half of its moisture when passing over the Stanovoi mountains.

Sky cover is much the same in August as in July, but the wind becomes weaker and consequently sky cover on the Far Eastern coast diminishes to a certain extent, and ~~is now between~~ becomes 6 ~~and~~ or 7.

The prevailing wind of winter starts to blow in September with a consequent decrease of sky cover over Transbaikal, Amur, Manchuria, and the Far Eastern region. It has a ~~rating~~ value of about 5 in Transbaikal and 5 or 6 in Amur, the coasts of the Sea of Japan, and the west coastal area of the Sea of Okhotsk. It increases in Western and Central Siberia and in the Far Eastern coastal area. It is 8 or more on the Arctic coast and, decreasing to the south, it stands at 6 or 7 in Western and Central Siberia, and is much less in Mongolia and Turkestan which have a ~~rating~~ value of 3 or 4 and 2 or under respectively. It is slight at Petropavlovsk on the east coast of the Kamchatka peninsula and heavy on the west coast.

There is a slight increase in sky cover in October over Central and Western Siberia, and in the Lake Baikal area and Transbaikal. It decreases somewhat on the Far [illegible] It increases

to 2 or 3 in Turkestan and decreases to 2 or 3 in Mongolia. From the center to the eastern coast of Kamchatka it is 5 or 6, and is heavier, about 8, on the west coast.

In November sky cover is heavier in Western and Central Siberia, with a value of 7 or 8, but it is slight over an extensive area that includes Turkestan, Mongolia, Manchuria, Transbaikal, Amur, Yakutsk and the Far Eastern coastal area, which have the following values:

Turkestan 3 or 4; Mongolia 3 or above; Manchuria 3 or 4; Mongolia 3 or above; Manchuria 3 or 4; Tranbaikal and Amur, about 4; the Far Eastern coastal area and Yakutsk, about 5. It has decreased on the Arctic coast to about 6.

With the exception of Turkestan, sky cover decreases everywhere in December. In Western and Central Siberia it is 6 or 7, and 2 or 4 over Mongolia, Manchuria and the Far Eastern coast. In Turkestan it increases to 5 or 6.

(Mask for Table on page 16 of appendix)

Sky Cover

	Place Name	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Year
a	Obdorsk													
b	Tobolsk													
c	Barnaul													
d	Tomsk													
e	Akmolinsk													
f	Yeniseisk													
g	Turkhansk													
h	Blagoveshchenskiy Priisk													
i	Yakutsk													
j	Russkoye Ustye													
k	Verhoyansk													
l	Kirensk													
m	Irkutsk													
n	Chita													
o	Okhotsk													
p	Nikolayevsk													
q	Vladivostok Harbour													
r	Alexandrovskiy Post													
s	Petropavlovsk													

6. Number of ~~Days of Cloud~~ Cloudy Days

The number of ~~days of cloud~~ cloudy days depends on the average sky cover. Whether the day is fine or cloudy at any particular place can be determined by assessing the sky cover, but to make it more clear and comprehensible we have attached a set of maps (Nos 74 to 86) showing the distribution of cloudy days. For the sake of clarity let us take a brief look at the distribution of cloudy days in winter (January) and summer (July).

In January Western and Central Siberia have 10 to 12 days of cloud; Turkestan has 10 days; and the area that includes Mongolia, Manchuria, Transbaikal, Amur, the Aldan River and the Indigirka river basin has only 3 days or less. The eastern coastal area has 5 days, the interior of the Kamchatka peninsula barely 10, and its coastal areas 10 or 15 or more. November, December, February and March are much the same as January.

In July the eastern coasts and Manchuria have 10 to 15 days, and the Kamchatka Peninsula has 15 to 20. The Aldan river basin and the upper reaches of the Indigirka river have comparatively few, Ust-Maya having only 3 or 4. The reason for this is the proximity of the Stanovoi mountains. Kamchatka has 15 to 20 days or more; the Arctic coasts has about 14; and Western and Central Siberia have fewer than in winter. There are 5 to 10 in the upper reaches of the Obi and Yenisei Rivers. The Lake Baikal area, the Angara, Isunguska and Lena River basins have about 10. The Turkestan area is extremely dry and has barely 1 day of cloud. There is no data available for the Mongolian area, but it is thought that it has about 5 days. June and August are about the same as July. April, May, September and October are the periods of transition between winter and summer.

In the course of a year there are 120 or more days of cloud in Western and Central Siberia and in the Arctic coast, the Bering Sea, Kamchatka and the Sea of Okhotsk. Turkestan, Mongolia, Manchuria, Transbaikal, Amur, the Aldan River basin, the west coast of the Sea of Okhotsk, and the Sea of Japan have between 50 and 80 days.

8B

(Mask for Table on p 17)

~~Number of Days of Clear~~ Cloudy ~~Days~~

★ Number of Cloudy and Fine Days*

** (Upper figures show number of cloudy days; lower figures, number of fine days.)

	Place Name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
a	Obdorsk													
b	Tobolsk													
c	Barnaul													
d	Tomsk													
e	Akmolinsk													
f	Yeniseisk													
g	Turkhansk													
h	Blagoveshchenskiy Priisk													
i	Yakutsk													
j	Russkoye-Ustye													
k	Verkhoyansk													
l	Irkutsk													
m	Chita													
n	Okhotsk													
o	Nikolayevsk													
p	Vladivostok Harbour													
q	Alexandrovskiy Post													
r	Petropavlovsk													

* In Siberia a day is termed cloudy when the total sky cover for the three daily observation periods is 25 or over. This approximates to the usage in Japan, where a day is termed cloudy if the average sky cover for the day is 7.5. A fine day is one on which the total sky cover [illegible] 4.5 or below. In Japan, a day is termed fine when the average cloud cover is 2.5 or below.

7-

Precipitation

Precipitation in Siberia is slight in winter and over half the yearly amount falls in the summer. An area of high pressure covers the continent in winter and cold dry air blows off the land towards the sea, which produces fine weather. Consequently, Mongolia, Manchuria, Transbaikal, Amur, the Maritime provinces and the Arctic coast are all very dry and have a monthly precipitation of 5 mm or less; Western Siberia has a comparatively heavy precipitation of 10 to 20 mm, on account of its proximity to the moisture-laden westerly winds of Europe and also to the low-pressure area of Europe. In summer the continent forms a low pressure area and moist air is carried off the sea by the summer prevailing wind into the middle of Siberia. Hence, precipitation is everywhere heavier in summer, especially in the Far Eastern regions of Manchuria and the Maritime provinces. It is also heavy in the zone lying between 50° and 60° north, which has a yearly total of 300 to 500 mm. It is also heavy in the zone lying between 50° and 60° north, which have a yearly total of 300 to 500 mm. It is ~~less heavy~~ lighter further south. On the Arctic coast and in Mongolia it is 200 mm or less and in Manchuria and the Maritime Provinces it is 400 to 600 mm. Turkestan, however, has a winter precipitation of 10 to 30 mm a month and a summer precipitation of a month 10 mm or less. Some places are extremely dry, with 0 to 1 mm, and hence there a number of deserts at various places in the region stretching between Turkestan and Mongolia.

Kamchatka peninsula projects into the Pacific with the Bering Sea to the east and the Sea of Okhotsk to the west; thus in summer it is exposed to moist air currents on all sides so that its yearly precipitation is very heavy, particularly on both coasts which are are mountainous. Precipitation is less in the interior which is table-land. Petropavlovsk has a yearly total of 1000 mm. Precipitation is surprisingly heavy also in the zone lying between 50° and 60° north and there are 10 to 20 rainy days between May and September. This is because in summer vapor pressure is 12 to 13 mm; there is a large amount of sunshine

and the ground surface is warmed. In Mongolia and Turkestan there is also a large amount of sunshine and the earth's crust is hot, but the air has little moisture content and accordingly thunderstorms are very rare.

The following is a brief account of the precipitation month-by-month (maps No 87-99).

In January and February precipitation takes the form of snow. It is extremely slight, 5 mm or less, over a wide area that includes Mongolia, Manchuria, Transbaikal, Amur, the west coast of the Sea of Okhotsk, the Verkhoyansk area, and the eastern coastal region. The coasts of the Sea of Japan have 10 mm; the east coast of Kamchatka Peninsula has 50 mm and the west coast 20 mm or less. Western Siberia and the Ob and Yenisei Rivers and the Upper Reaches of the Lena River have a comparatively heavy fall of 10 to 20 mm. It is heavy in Turkestan in winter; Kazalinsk has a fall of 10 mm, Tashkent 44 mm, and Ashyahabad 26 mm.

Precipitation is much the same in March as in January and February, but it increases in Turkestan to 12 mm at Kazalinsk, 62 mm at Tashkent, and 45 mm at Ashyuhabad.

In April precipitation is somewhat heavier in Manchuria and the Far Eastern coastal region, but it is lighter in Mongolia and on the Arctic coast where it is 5 mm or less. It is 10 mm to 20 mm in Western Siberia and 20 to 40 mm in the Tomsk and Semipalatinsk areas, and in Turkestan there is little change from the previous month.

In May the summer wind from the south begins to blow on the Far Eastern coast, and the shores of the Sea of Japan have a rainfall of 50 to 80 mm. Western Siberia has 30 to 50 mm, the Arctic coast 10 mm or less, and Mongolia 20 mm or less. Rain is less in Turkestan, where the Turan Plain has a fall of 10 mm or less.

In June precipitation on the eastern coasts increases gradually to 70 to 100 mm and in Western Siberia to 100 mm. The northeastern corner of Lake Baikal has less than the surrounding country, with a reading of 30 mm. The Kolyma and Indigirka

Rivers and the Aldan River basin all have a slight fall of 30 mm or below, as the summer wind from the sea cannot penetrate the area on account of the intervening Stanovoi mountain. Turkestan has 10 mm or less.

In July and August the summer seasonal wind reaches its peak and the zone 50° to 60° north, from the eastern coast to Central and Western Siberia, has a heavy rainfall. In the Maritime provinces it is 70 to 100 mm, about 70 mm in Central and Western Siberia, and north of latitude 60° north generally 50 mm or less. North of latitude 70° N on the Arctic coast it is less than 30 mm. Turkestan now reaches its driest period of the year and has less than 5 mm and in some places it has a precipitation of only 1 mm. The Bering Sea coast of Kamchatka has over 50 mm and Petropavlovsk has 100 mm.

The summer wind falls off in September and when the winter wind sets in precipitation decreases suddenly all over the continent, with the exception of the shores of the Sea of Japan where the summer wind continues to blow and where there is a rainfall of over 100 mm. There is 30 to 50 mm in Western Siberia, Irkutsk Oblast, Transbaikal and Amur; less than 200 mm [sic] on the Arctic coast; and less than 3 mm in Turkestan. In Kamchatka there is no change from the volume in August.

In October there is 30 to 50 mm in Western Siberia; 30 to 50 mm on the Far Eastern coasts; 10 to 20 mm in the Lake Baikal area; 20 mm in the Amur region; 10 to 20 mm in the Lena, Yana, Indigirka and Kolyma river basins; less than 10 mm in Turkestan and Mongolia; 30 to 50 mm in Kamchatka and over 100 mm at Petropavlovsk.

In November precipitation decreases everywhere. It is less than 10 mm in the area from Mongolia, Transbaikal, Amur, the Aldan, Yana and Indigirka river basins up to the Arctic coast; 20 to 30 mm in Western Siberia; and 10 to 20 mm in the Lena river basin and the Lake Baikal area. It increases at some places in Turkestan to about 10 mm.

Precipitation in December is largely the same as in January.

B. Number of Days of Precipitation

The number of days of precipitation corresponds roughly to the volume of precipitation. However, in Western Siberia the volume of precipitation is small and number of days of precipitation unproportionately large, since the volume of each fall of snow and showers of rain is small. The precipitation of Western Siberia and of the Far Eastern area is governed by different factors. Western Siberia is affected by the air currents from Europe which have not discharged their moisture, and the weather of the Far Eastern regions is controlled by the winter and summer seasonal winds. Generally speaking, the middle and upper reaches of the Ob and Yenisei Rivers of Western Siberia have their maximum number of wet days in November and December, 15 days or more per month, and their minimum number in April.

The Far East, however, has its minimum number of wet days, from 3 to 5, in December and January, and its maximum, from 10 to 15 days, when the summer seasonal wind is at its height in July and August. In the Siberian plain in July there are generally over 10 days of rainfall, which falls ~~pretty~~ rather evenly from East to West. The figures for the yearly number of days of precipitation read as follows: Western Siberia and the eastern Siberian plateau, 140 to 160; Turkestan, 30 to 60; Mongolia, 50; Outer Baikal, Amur, the West Shores of the Sea of Okhotsk and the Arudan River basin, 80 to 100; the shores of the Sea of Japan, 100; Kamchatka Peninsula, 120 to 180.

The following is a brief survey of the number of days of rainfall month by month:

In January, there are 15 days of rainfall in the Omsk and Tomsk areas of Western Siberia, and 10 to 15 elsewhere. The vast area that extends over Mongolia, Outer Baikal, Amur, Manchuria, and the shores of the Sea of Japan have only 3 to 5. The Arctic coast and Petropavlovsk in Kamchatka, which is

Yin-shan mountains.

The winter wind starts to blow early in September on the Far Eastern coasts, with the result that there are fewer days of rainfall. Okhotsk and Ayan on the west coast of the sea of Okhotsk, however, is wetter than in August, and has over 10 days of precipitation. From this region to the ~~Heilung~~ Amur River and Manchuria there are over 10 days. Between the Transbaikal area and the Ardan river basin there are 7 to 8. In Western and Eastern Siberia and Turkestan there is no change from the previous month. Petropavlovsk has less than 10 days and the rest of Kamchatka over 10 days.

In October the winter wind blows everywhere, and east of the Transbaikal area to the Far Eastern coastal regions precipitation decreases to 6 to 8 days a month. There are over 10 in the area between the Kolyma river and Kamchatka; 10 to 15 in Eastern and Western Siberia; and 1 to 3 in Turkestan, where there is no great change at this time.

In November precipitation again decreases to 4 to 6 days in the region between Transbaikal and the Far Eastern coastal regions. In contrast it reaches its yearly maximum of over 15 days in Western and Eastern Siberia. Turkestan has 2 to 4 days, and Kamchatka Peninsula, with the exception of the Petropavlovsk area, has 10 or more days.

December is largely the same as November, except that precipitation increases slightly to 3 to 5 days in Turkestan.

9. Snowfall

In Siberia, precipitation in winter is almost always in the form of snow on account of the extremely cold climate. Thus the distribution of the number of days of snowfall in winter corresponds roughly to the distributors of the number of days of precipitation. (See Map No 113, Number of Days of Snowfall).

~~Yearly~~ Annual snowfall figures show that the Arctic coast often has 100 or more days of snowfall, as the snowy season is long; it is possible to have snow there

almost all the year round. Western and Central Siberia and Kamchatka have over 80 days; the Transbaikal and Amur areas, Manchuria, the eastern coastal regions and the Aldan river basin have a smaller number, 20 to 40. Snowfall is light and snow cover rarely exceeds 1 meter in depth. The falling snow is cold and does not melt, but accumulates; snow cover reaches its maximum depth at the beginning or middle of March in the Arctic regions and at the beginning or middle of April elsewhere. Map No 114 gives the distribution of snow cover at its maximum and shows that it is generally heavy over Western Siberia and Kamchatka and slight over Transbaikal, Manchuria, and the Aldan and Yana river basins. Thus the lower reaches of the Yenisei river have a cover of 100 cm; Western and Central Siberia 60 to 80 cm; and Kamchatka 100 cm. Outer Baikal has barely 10 to 20 cm and the Aldan and Yana River basins have 20 to 30 cm. This snow cover helps retain the low temperature of the earth's surface, thus having a vital relation to the phenomena of the permanently frozen soil and also a certain effect on the temperature in these regions. The southern limits of these permanently frozen layers of soil, where the snow cover is deep, is in the vicinity of Turansk and Berezovo in Siberia. In the east the area with a thin snow cover extends far to the south to Transbaikal and the Aldan River.

The next maps, Nos 115 and 116, show the first and last dates of snowfall for the various areas. It will be seen that the Arctic coast has its first snow at the beginning of July and its last at the end of June, so that in these regions it frequently shows all the year round. The ISOCHRONIC lines for the first snowfall generally run parallel to lines of latitude, but farther south, in Southern Siberia, they become complicated owing to the influence of Lake Baikal upon the climate, and also to the existence of mountain peaks. Here the first snows fall at the beginning of October. Around the latitude 50° north the last snow fall occurs in the middle of May; further north, at latitude 60° in the latter part of May, and at latitude 70° in the middle of June.

The table below shows dates of first and last snowfall [illegible]

Place Name	First Snowfall	Last Snowfall	Place Name	First Snowfall	Last Snowfall
Obdorsk	Nov 2	June 15	Russkoye Ustye	July 6	June 13
Tobolsk	Nov 20	May 15	Verkhoyansk	Aug 24	June 8
Tomsk	Nov 30	May 18	Kirensk	Sept 23	May 22
Barnaul	Oct 2	May 9	Irkutsk	Sept 7	May 27
Akmolinsk	Oct 6	May 21	Chita	Sept 28	May 23
Yeniseisk	Sept 23	May 18	Nikolayevsk	Oct 10	May 21
Semipalatinsk	Oct 11	April 30	Vladivostok	Nov 3	April 8
Turkhausk	Nov 8	June 19	Alexandrovskiy Post	Oct 18	May 17
Blagoveshchenskiy Priisk	Nov 6	May 25	Petropavlovsk	Oct 25	June 9
Yakutsk	Nov 18	May 13			

10.

Fog

There is a great deal of fog on the eastern and Arctic coasts and on the coasts of Kamchatka, but little within the continent. The total number of days of fog on the Pacific coast is 40 to 60, and at the Yamal and Taimyr Peninsulas on the Arctic coast it is over 100. Irkutsk, Transbaikal, Amur and Yakutsk have 15 to 20 days, and the southern parts of Western Siberia have between 10 and 20. There is practically none in the Yeniseisk, Turkhansk and Surgut areas. In the summer, in July and August, it is much greater on the Pacific and Arctic coasts, and in Transbaikal and Irkutsk. The mid-reaches of the Ob River and the Tobolsk area of Western Siberia are most foggy in October; the southern parts of Western Siberia, the Tomsk, Barnaul and Minusinsk areas are most foggy about January and February; Yakutsk and Olekminsk, about January.

The fogs of the Far Eastern coastal regions are caused by the summer prevailing wind. This starts to blow in May and brings with it a great deal of fog, which is heaviest in July and August. The moist air from the south [illegible] the

cliffs of the sea coast rises and mixes with the comparatively cool air of the coastal regions and turns to fog. Vladivostok and the south coasts of Kamchatka are muffled in fog for over half the months of July and August, which causes serious disruption of shipping. On the Yamal peninsula on the Arctic coast and in the Kara area it is thick in summer and fairly thick in winter. In summer the cold northeast wind blows off the Arctic Ocean and mixes with warm moist air of the area and in winter the low pressure area of Scandinavia often extends over these regions.

(~~Use for~~ Table on Page 23 of appendix)

Number of Days of Fog

	Place Name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yearly
a	Obdorsk													
b	Tobolsk													
c	Barnaul													
d	Tomsk													
e	Akmolinsk													
f	Yeniseisk													
g	Tvkhansk													
h	Blagoveshchensk/ Priisk													
i	Yakutsk													
j	Russkoye-Ustye													
k	Verkhoyansk													
l	Kirensk													
m	Irkutsk													
n	Chita													
o	Okhotsk													
p	Nikolayevsk													
q	Vladivostok Harbour													

Table con'd

Table (continued)

r	Alexandrovskiy Post
s	Petropavlovsk

11. Freezing and Thawing ~~of Rivers~~

As ~~it~~ is extremely cold ~~in~~ winter in Siberia, its rivers and lakes, harbors and soil ~~the soil~~ all become frozen. Sheet or floating ice on the sea is a great hindrance to shipping and the presence or absence of floating ice on the sea of Okhotsk and around Kamchatka effects the weather of Japan. On the Arctic coast rivers freeze at the beginning of October and the ice-up moves gradually southward until by the end of November the rivers and lakes of the continent are all frozen. Lake Baikal, however, has a high thermal content and does not freeze until late December. The thaw starts in late April in the region of 50° north; by the middle of May it has reached 60° north; and by the middle of June it has reached the mouths of the rivers that flow into the Arctic Ocean. Rivers and lakes become completely ice-free 10 days after the ice begins to break up. Lake Baikal is not ice-free until late in May. Maps No 117 to 119 show the dates of freezing, thawing and complete disappearance of ice.

The following chart shows the dates of freezing and thawing of the main rivers and will serve as a supplement to the information given in Part I of this document:

Name of River a	Observation Post b	Thaw c	Freeze d	Completely Ice-Free e
Ob f	1- Alexandrovo			
"	2- Barnaul			
"	3- Obdorsk			
"	4- Kamen			
Irtysh g	5- Semipalatinsk			
"	6- Omsk			
"	7 Tara			
"	8 Tobolsk			
"	9 Samarovo			
Ishim h	10 Akmolinsk			
"	11 Petropavlovsk			
"	12 Ishim			
Tobol i	13 Zaozernoye (GOLOVSKOYE)			

Table con'd

Name of River	Observation Post	Thaw	Freeze	Completely Ice-Free
Tobol	14 Iyevlevo			
	15 Verkhne-Berkhtert			
Chulym	16 Tutalskoye			
	17 Achinsk			
Yenisei	18 Krasnoyarsk			
	19 Nazimovo			
	20 Tolstiy Nos			
Angara	21 Irkutsk			
	22 Bratskoye			
	23 Vladimirova			
Lena	24 Kirensk			
	25 Olekminsk			
	26 Markh			
Aldan	27 Ust-Maya			
Kolyma	28 Rodcheva			
	29 Sredne Kolymsk			
	30 Nizhne Kolymsk			
Yana	31 Verkhoyansk			
	32 Kazachye			
Indigirka	33 Russkoye Ustye			
Vilyui	34 Vilyuisk			

Note: The day on which a river is said to be frozen is that day when there is a sheet of ice stretching from one bank to the other, regardless of thickness, or when the flow of the river is completely stopped by drift ice. The day on which a river is said to have thawed is that day when the sheet ice thaws or when the dirft ict starts to move with the current of the river.

The Arctic Ocean is frozen for a large part of the year and there is only a very short period in some places when it is ice-free. Bering Sea, the Sea of Okhotsk and the Sea of Japan are also ice-bound, but the period when they are ice-bound varies each year. However, the coasts of Bering Sea start to freeze as a rule between the middle of November and the middle of January, and gradually thaw towards June. The northern parts of the Bering Sea Straits, however, are only ice-free from late July until early August. The east coast of Kamchatka thaws earlier and Petropavlovsk is ice-free by the end of March. However, Petropavlovsk is rarely completely ice-bound, and even in winter, shipping is not usually interrupted.

The shores of the Sea of Okhotsk freeze about the beginning of November and Okhotsk and Ayan thaw in the middle or at the end of May. Further north at Kidiga Bay the freeze-up is a little later and the thaw takes place about the end of April. Amur Bay begins to freeze at the end of October and is ice-free from the end of May until the end of June. ~~Kwantung~~ MAMIYA [STRAITS OF TARTARY] Straits freeze about the end of November and thaw at the beginning of May. The shores of the Sea of Japan freeze in the middle of December, and sometimes earlier, in the middle of November, and are ice-free about the middle of April. Vladivostok harbour is rearely completely frozen, and shipping is never interrupted. (See the information in Part II on freezing and thawing of places on the Pacific coast.)

On account of the cold climate of Siberia the ground is frozen hard and in the north there is an area of 600,000 sq kilometers with a permanently frozen stratum of soil. The earth's surface thaws slightly in summer but the sub-soil remains frozen. This factor affects animal and plant life, ~~both~~ from the point of view of both agriculture and engineering enterprises. Map No 120 gives the extent of the frozen areas. On the Far Eastern regions snow cover is slight in winter, but on account of the extremely cold atmosphere there is a permanently frozen stratum of soil, which stretches southwards as far as latitude 50° N. In Western Siberia the deep winter snow cover preserves the warmth of the earth, and in addition the temperature is higher than in the Far East so that the southern limit of the permanently frozen soil stratum is in the region of 65° north. The following table shows the distribution of the frozen areas (as in Map No 120) and also gives earth temperatures for reference. The shading used on the map is to be interpreted as follows:

1. Southern extremity of the permanently frozen soil strata.
2. Geographically adjacent frozen areas
3. Frozen areas with scattered zones that do not freeze
4. Zones which do not freeze but which include scattered frozen areas

Mask for p. 28

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yearly	Difference
a Bomnak b (Lat 54° 43' N. Long 128° 52' E. Elevation 352 m.														
Mean Temperature (meters) c														
Soil Temperature d														
1.5														
" 2.0														
" 2.8														
" 5.0														
e Barnaul f (Lat 52° 20' N. Long 83° 47' E. Elevation 162 m.														
Mean Temperature (meters) g														
Soil Temperature h														
0.0														
" 0.4														
" 0.8														
" 1.6														
" 3.6														
i Tomsk j (Lat 56° 30' N. Long 84° 58' E. Elevation 124.9 m.														
Mean Temperature (meters) k														
Soil Temperature l														
0.0														
" 0.4														
" 0.8														
" 1.6														
" 3.2														

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(End Doc No 273908)

MAPS

SECRET

1. Map No 1 - Atmospheric Pressure and Wind Direction — January
   a) " " " " " " January.

2. Map No 2. Atmospheric Pressure and Wind Direction — February.
   a) " " " " " " February.

3. Map No 3 Atmospheric Pressure and Wind Direction — March
   a) " " " " " " March

4. Map No 4 Atmospheric Pressure and Wind Direction — April
   a) " " " " " " April

5 Map No 5 Atmospheric Pressure and Wind Direction — May
   a) " " " " " " May

6 Map No 6 Atmospheric Pressure and Wind Direction — June
   a) " " " " " " June

SECRET

SECRET

7 Map No 7 Atmospheric Pressure and Wind Direction July

a) " " " " "
July

8 Map No 8 Atmospheric Pressure and Wind Direction August

a) " " " " "
August

9 Map No. 9 Atmospheric Pressure and Wind Direction September

a) " " " " "
September

10 Map No 10 Atmospheric Pressure and Wind Direction October

a) " " " " " "
October

11 Map No 11 Atmospheric Pressure and Wind Direction November

a) " " " " " "
November

12 Map No 12 Atmospheric Pressure and Wind Direction December

a) " " " " " "
December

13. Map No. 13. Atmospheric Pressure and Wind Direction. Entire Year

a) " " " " "
Entire Year

SECRET

SECRET

14 Map No 14 Temperature (Sea level ~~reckoning~~) January 1881 — 1915

a) " " "
January 1881 - 1915

15 Map No 15 Temperature (Sea level ~~reckoning~~) February 1881 - 1915

a) " " "
February 1881 - 1915

16 Map No 16 Temperature (Sea level ~~reckoning~~) March 1881 - 1915

a) " " "
March 1881 - 1915

17 Map No 17 Temperature (Sea level ~~reckoning~~) April 1881 - 1915

a) " " "
April 1881 - 1915

18 Map No 18 Temperature (Sea level ~~reckoning~~) May 1881 - 1915

a) " " "
May 1881 - 1915

19 Map No 19 Temperature (Sea level ~~reckoning~~) June 1881 - 1915

a) " " "
June 1881 - 1915

20 Map No 20 Temperature (Sea level ~~reckoning~~) July 1881 - 1915

a) " " "
July 1881 - 1915

SECRET

SECRET

21 Map No 21 Temperature (Sea level ~~Reckoning~~) August 1881 - 1915

a) " " " "
August 1881 - 1915

22 Map No 22 Temperature (Sea level ~~reckoning~~) September 1881 - 1915

a) " " " "
September 1881 - 1915

23 Map No 23 Temperature (Sea level ~~reckoning~~) October 1881 - 1915

a) " " " "
October 1881 - 1915

24 Map No 24 Temperature (Sea level ~~reckoning~~) November 1881 - 1915

a) " " " "
November 1881 - 1915

25 Map No 25 Temperature (Sea level ~~reckoning~~) December 1881 - 1915

a) " " " "
December 1881 - 1915

26 Map No 26 Temperature Yearly averages 1881 - 1915

a) "
Yearly Averages (Sea level Reckoning) 1881 - 1915

27 Map No 27 ~~Temperature Amplitude~~ Max amplitude of Temperature Variations monthly averages. 1881 - 1915

a) " " Sea level ~~reckoning~~
Monthly Averages 1881 - 1915 Sea level ~~reckoning~~

SECRET

28 Map No 28 Isotherms of average Temperature −15°C in Spring

29 " " 29 −15°C in Autumn

30 " " 30 −10°C in Spring

31 " " 31 −10°C in Autumn

32 " " 32 −5°C in Spring

33 " " 33 −5°C in Autumn

34 " " 34 0°C in Spring

35 " " 35 0°C in Autumn

36 " " 36 5°C in Spring

37 " " 37 5°C in Autumn

38 " " 38 10°C in Spring

39 " " 39 10°C in Autumn

40 " " 40 Number of day with Daily average Temperature −15°C or over

41 " " 41 " " average Temperature −10°C or over

42 " " 42 " " " average Temperature −5°C or over

SECRET

43 Map No 43. Number of days with Average Temperature 0°C or over

44 " " 44 " " " " " " 5°C " "

45 " " 45 " " " " " " 10°C " "

46 " " 46 " " " " maximum Temperature equal to or less than 0°C

47 " " 47 " " " " minimum " " " " " " "

48 " " 48 Average humidity January

49 " " 49 " " February

50 " " 50 " " March

51 " " 51 " " April

52 " " 52 " " May

53 " " 53 " " June

54 " " 54 " " July

55 " " 55 " " August

56 " " 56 " " September

57 57 October

58 " " 58 " " November

59 " " 59 " " December

60 " " 60 " " Entire year

SECRET

61	Map No 61	Sky Cover		January
62	" " 62	" "		February
63	" " 63	" "		March
64	" " 64	" "		April
65	" " 65	" "		May
66	" " 66	" "		June
67	" " 67	" "		July
68	" " 68	" "		August
69	" " 69	" "		September
70	" " 70	" "		October
71	" " 71	" "		November
72	" " 72	" "		December
73	" " 73	" "		Entire Year
74	" " 74	Number of Days of ~~Low~~ Overcast weather		January
75	" " 75	" "		February

SECRET

SECRET

76 Map No 76 Number of days of ~~cloudy weather~~ Overcast March

77 " " 77 April

78 " " 78 May

79 " " 79 June

80 " " 80 July

81 " " 81 August

82 " " 82 September

83 " " 83 October

84 " " 84 November

85 " " 85 December

86 " " 86 Entire Year

87 " " 87 ~~Precipitation~~ (mm.) January

88 " " 88 " " February

89 " " 89 " " March

90 " " 90 " " April

SECRET

SECRET

91	Map No	91	~~Rainfall~~ Precipitation (mm)	May
92	"	" 92		June
93	"	" 93		July
94	"	" 94		August
95	"	" 95		September
96	"	" 96		October
97	"	" 97		November
98	"	" 98		December
99	"	" 99		Entire year.
100	"	" 100	Number of days of ~~Rainfall~~ Precipitation	January
101	"	" 101		February
102	"	" 102		March
103	"	" 103		April
104	"	" 104		May
105	"	" 105		

SECRET

106	Map No 106	Number of day. of ~~rainfall~~ Precipitation		July
107	" "	107		August
108	" "	108		September
109	" "	109		October
110	" "	110		November
111	" "	111		December
112	" "	112		Entire year
113	" "	113	Number of days of Snowfall	Entire year
114	" "	114	Snow cover (cm.) (at time of maximum depth.)	
115	" "	115	First Snow~~fall~~	
116	" "	116	Last Snow~~fall~~	
117	" "	117	~~Isotherms of freezing~~ isogram equal of freezing dates	
118	" "	118	~~Isotherms of thawing~~ isotac	
119	" "	119	~~Isogram of date of complete disappearance of ice~~	
120	" "	120	Distribution of permanently frozen ~~area~~ strata.	